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NPIC/TDS/D-843-67
19 May 1967

MEMORANDUM FOR: Deputy Chief, Development Staff, TDS

THROUGH : Chief, Support Systems Branch, DS/TDS

SUBJECT : Evaluation of Special Drying Techniques - [REDACTED]

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1. On May 4, 1967, a visit was made to [REDACTED] to review some microwave drying equipment being exhibited by the [REDACTED]. The exhibit was part of [REDACTED] display at a trade fair. [REDACTED] set up in 1947 as a subsidiary of the [REDACTED]. Its purpose is to sell or lease patents owned by the [REDACTED] providing a monopoly and thus an incentive to further develop the invention. [REDACTED] has a lease on patent for the microwave dryer displayed at the show.

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2. [REDACTED] demonstrated the dryer. It was drying 12 inch wide paper at about 30 feet per minute. The paper was similar in weight and consistency to writing paper. The power supply was 1800 watts. This unit was specifically designed for roll paper. Cut film and photographic prints could not be tested in the machine. [REDACTED] of the [REDACTED] the inventor of the dryer was also present at the demonstration.

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3. The unit was about 8 feet long by 2 feet wide. The equipment was "L" shaped with the vertical leg about 7 feet high. No carrier belt was used for supporting the paper. The power supply and controls occupied about half of the equipment volume. A variable speed drive was used to vary paper speed from near zero to 50 feet per minute. Some wrinkles were being formed on the paper. However, they were probably caused by the type of rollers being used and were not caused by the drying technique.

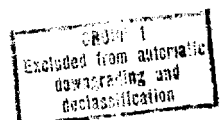
4. On May 5, 1967, the [REDACTED] was visited in [REDACTED]. The Film Board has an excellent reputation for its production of films and still photography. [REDACTED] Manager of the photo lab showed us their experimental microwave dryer. This unit was operated by an 1800 watt power supply. A color print was dried at about one foot per minute. The screen used as a carrier belt left impressions

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on the print. The power supply malfunctioned before the color film could be tested on the dryer. Some consideration to radiation shielding had been given to the construction of this equipment. A 25 to 50 KW power supply was suggested by [REDACTED] for a production machine. However, he admitted that RFI and radiation problems had not been fully considered.

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5. This unit was capable of drying 40 inch wide prints of any length. The carrier belts were made of woven fiber glass. The power supply was about 2 feet square by three feet high although it was apparent from the way it was packaged that it could have been designed into a smaller space. The power supply was not noisy, but the blower used to draw off moisture produced considerable noise.

6. Since both pieces of equipment demonstrated were experimental and one was not designed for drying photographic materials, at this time it is not possible to conclude whether microwave drying can solve NPIC's problems. While it has been shown that microwaves certainly have potential in the drying of photographic materials, more research is needed to determine power supply sizes, possible speeds, and radiation and RFI shielding requirements.

7. On April 26, [REDACTED] of Wright-Patterson AFB was asked about department's plans for microwave drying. He said that the Air Force would probably negotiate two development contracts, [REDACTED] to develop microwave drying.

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NPIC/TDS/DS [REDACTED] (19 May 67)

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Air Bearing

 $2\frac{1}{2}$ KW Magnatron Generator 15" x 18" x 24"2450 megacycles
2,450,000 cycles/sec. - field is jumping $\frac{1}{4}$ wavelength

illuminator

lossless plastic

15 ft./min. - $\frac{3}{8}$ " ~~84~~ wideCould use ^{cut} film on continuous belt.Low ^{nuclear} radiation

Screening could eliminate RFI

Would prefer to use two drums.

20" x 24" x 40" size of ^{controls} ~~power supply~~

Diago paper

$$\frac{11 \text{ in}}{11 \text{ sec}} = \frac{60}{\text{min}}$$

white photo paper

$$\frac{10\frac{1}{2} \text{ in}}{6 \text{ sec.}} = \frac{105}{\text{min}}$$

photo. paper

$$\frac{12 \text{ in}}{3.5 \text{ sec.}} = \frac{12 \text{ in}}{\text{min}}$$

more like 20 ft. min
film

$$\frac{25}{\frac{12}{2+5}} = \frac{35}{3}$$